

ELECTRICAL & ELECTRONICS
PERFORMANCE & RELIABILITY



TRUSTED **PERFORMANCE &** **RELIABILITY** SERVICES

DEMONSTRATE THE **QUALITY, SAFETY** AND **RELIABILITY** OF
ELECTRICAL & ELECTRONIC PRODUCTS

SGS

LOCALLY AVAILABLE WORLDWIDE

Electrical and electronic product manufacturers and retailers are under increasing pressure from clued in consumers who know about sustainability, energy efficiency and green issues. Partner with SGS to deliver well designed, desirable goods that are trusted for real life whilst ensuring quality, safety and sustainability for retailers and consumers.

WHO IS SGS?

SGS is the world's leading inspection, verification, testing and certification company. SGS is recognised as the global benchmark for quality and integrity. With **90,000 employees**, SGS operates a network of over **2,000 offices** and laboratories around the world. As a result, our expertise provides a single consolidated source to reduce your risk, improve efficiency and quality, and ensure compliance.

SOLUTIONS

- Hazardous substances
- Product safety
- EMC (Electromagnetic Compatibility)
- Audit & certification
- Performance & reliability
- Product inspection
- Sustainability (ErP - Energy related Products, Ecodesign, Energy Efficiency, PEP - Product Environmental Profile, etc.)

NEW MARKETS AND PRODUCTS

- Electro medical devices
- Wireless devices & applications
- Photovoltaic modules

COVERING ALL CONSUMER ELECTRONICS

- Household appliances
- Luminaries
- Batteries
- Power supplies
- Information Technology (IT)
- Audio/Video equipment
- Power tools
- Automotive parts

THINKING SUSTAINABLY

Across our global network of sustainability experts we can support your company in its strategy by offering a range of services covering the environmental, safety and social aspects of sustainability:

- Restricted substances management
- Social responsibility solutions
- Ecodesign services



PERFORMANCE & RELIABILITY

Is your product as good as you claim it is? Performance & Reliability testing will identify issues, reduce the risk of product recalls and cut development costs.

WHAT IS P&R TESTING?

Performance & Reliability tests verify the ability of a product to function at required parameters under various conditions throughout its lifetime. Intensive testing of specific samples will ensure that failures only occur in the lab and not in your customer's hands.

RELIABILITY

Reliability testing ensures a product works as expected in normal and unusual situations. Such tests enable producers and retailers to estimate a product's life span and identify the causes of failures.

PERFORMANCE

Performance testing is not related to any directives and in most cases is carried out at the end of the product development stage, after all other tests have been completed successfully. It is a comprehensive survey, which entails verifying all relevant test protocols and certificates and creating the required Technical Construction File (TCF).

YOUR BENEFITS

SGS can carry out performance and reliability measurements against standards and regulations applicable in a specific market. Furthermore, our Performance & Reliability services can be adapted to perform testing to manufacturer or retailer-specific performance requirements. Other Performance & Reliability advantages:

- Lower costs associated with in-warranty and after sale product failures
- Brand recognition and increased consumer trust in your product
- A quality mark from SGS
- Benchmark information allows comparison against competitors
- Find out the real capacity of your product

WHY SGS?

SGS looks beyond a client's needs. We know retailers and manufacturers not only want their products to be safe, but also need to differentiate themselves in the market. Through our testing we support you ensure your product goes the extra mile:

- Manufacturers can improve products based on test result data
- Poorly performing products can be redesigned, or removed from the market

Our global network, extensive resources and knowledge of the **retail industry** allow us to provide reliable performance services to large and small retailers. Retailers acquiring large amounts of electronic products need to be sure they all meet both their own quality and durability expectations and those of their consumers.



PRODUCT SPECIFIC

SGS Performance & Reliability centres offer testing packages for specific product groups.

INFORMATION TECHNOLOGY & TELECOMMUNICATION PRODUCTS

Through various types of tests and analyses, SGS supports manufacturers check the reliability of information technology and telecommunication products, such as computers, tablets, handsets, network devices, office equipment and accessories.

- Environmental Simulation Tests
- Mechanical & Physical Properties Tests
- Electrical Properties Tests
- HALT & HASS
- Acoustic Measurements
- Material & Failure Analysis
- Connector Tests
- Battery Tests
- Reliability Consultancy

AIR CONDITIONING PRODUCTS

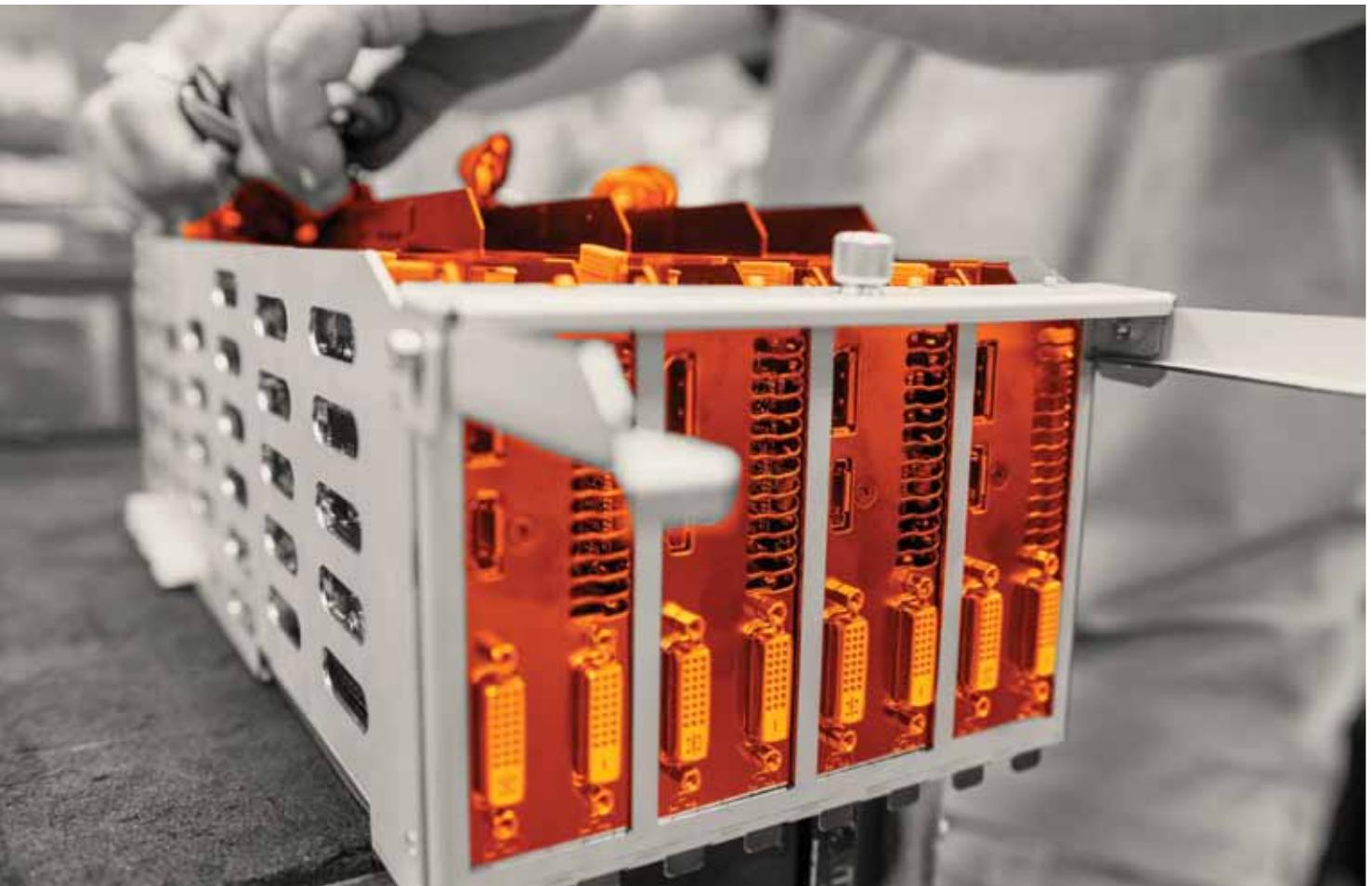
The testing performed includes the verification of various technical characteristics, fundamentally those related to the cooling power of air conditioners.

Standards used for Performance testing:

- EN 14511-1:2004
- EN 14511-2:2004
- EN 14511-3:2004
- EN 14511-4:2004

Secondary parameters verified during Performance testing:

- Outward appearance
- General condition of equipment before test
- Plates of characteristics



LIGHT SOURCES-PHOTOMETRIC TESTING

Photometric measurements investigate characteristics (performance and ergonomic aspects) of light sources and lighting installations. These parameters are very important for engineers and architects creating illumination designs for products or spaces.

Performance variables measured:

- Luminous intensity distribution
- Luminous flux (lumen)
- Utilisation factor (h)
- Service luminance (lux)
- Optical power (Watt)
- Colour rendering power index (Ra-index)
- Colour temperature (Kelvin)
- Chromaticity coordinates (x and y)
- Spectrum distribution wave of visual light
- Luminance distribution of lamps, luminaries, displays, background-lit symbols (cd/m²)
- Luminous efficacy

SGS carries out measurements on luminaries for normal use, safety luminaries, incandescent, fluorescent and discharge lamps, as well as control gear for lighting fittings (i.e. electronic terminals, or flat screens). Photometric measurements can be carried out in a week, with the following options:

- In combination with Safety, EMC and RoHS testing
- In combination with a certification (Safety, EMC and RoHS marks)
- As benchmarking and product development and quality control tests

POWER TOOLS

Our test capabilities are dedicated (but not limited) to the following power tools:

- Cordless drilling machines
- Cordless screwdrivers
- Percussion drilling machines
- Grinders
- Sanders
- Jig saws & circular saws
- Mini drills
- and more



PORTABLE ELECTRONICS-BATTERY & ACCUMULATOR

SGS has over 25 years of experience in Energy Storage System Design. We have played a leading role in the development of IEEE 1725/1625 standard and the CTIA battery certification working group.

Besides testing to IEEE 1725 SGS provides testing and consultancy on various other national and international battery standards:

- UN.83 Transport of Lithium Cells and Batteries
- UL 1642 – Applicable to Lithium-Ion “Cells”
- UL 2054 – Applicable for “Batteries” Lithium-Ion & others (NiMH, NiCad)
- IEC 62133 – Safety Requirements
- IEC 61960 – Performance
- IEC 61959 – Mechanical Tests
- GB/T 18287 – China’s Standard for Safety & Performance
- CB and BSMI Certifications Services

HOUSEHOLD APPLIANCES TESTING

Labelling and MEPS (regulated minimum energy efficiency levels) requirements are currently mandatory in most global markets. The following electrical products offered for sale need to carry an approved energy label:

- Refrigerators and freezers
- Clothes washers/dryers
- Dishwashers
- Air conditioners
- External power supplies
- Set top boxes
- Televisions
- Home entertainment products (audio and video equipment)
- Boiling and chilled water dispensers
- Vending machines
- Commercial ice makers
- A range of lamp types
- and more

TEST SPECIFIC

SGS Performance & Reliability testing labs are able to carry out a wide range of tests related to environmental, mechanical or electrical characteristics.



ENERGY EFFICIENCY TESTING & CERTIFICATION

Energy Rating labels, which evolve from the test results, enable consumers to compare the energy efficiency of E&E products on a fair and equitable basis. Energy efficiency is measured against specific standards which are periodically updated, prescribing higher levels of energy efficiency. SGS can perform tests that provide valuable data on the energy efficiency of consumer electronics:

- Photometric Tests for Lamps and Luminaires
- Stand by Current Measurements of Consumer Electronics
- Energy Consumption of Refrigerators
- Efficiency of Transformers

MATERIAL AND FAIL ANALYSIS

With the assistance of the following tests and analyses, manufacturers can define the root cause of failures, to enhance the reliability of products and components.

- Solderability Tests
- Surface Insulation Resistance Test
- Ion Migration Test
- C-SAM Analysis for Package Delamination
- Solder Joint Evaluations
- Moisture/ Reflow Sensivity & Heat Resistance Tests for Devices
- Micro Section Observation
- X-Ray Analysis for Solder Joints
- Thin Whisker Observation
- BGA Dye & Pry Test
- PCB Properties Test
- SEM/ EDS Analyses

MECHANICAL / PHYSICAL PROPERTIES TESTING

To ensure the proper functioning of various components in a product, SGS performs a comprehensive series of tests:

- Keypad/Switch Durability
- Bending & Twisting on PC Card & Memory Modules
- Insertion / Extraction Durability Test for Connectors
- Mating / Unmating / Normal Force Tests for Connectors
- Terminal Retention Force Testing
- Flexibility Tests for Cords
- Evaluation of Solder Joint Reliability

HIGHLY ACCELERATED LIFE/STRESS TESTING/SCREENING (HALT/HASS)

Manufacturers can better prepare products for consumer use by submitting them to tests that mimic extreme scenarios that might happen during use:

- Hot/Cold Temperature Step Stress Test
- Rapid Thermal Transitions Stress Test
- Combined Environment Stress Test
- Vibration Step Stress Test
- Highly Accelerated Stress Screen

ENVIRONMENTAL SIMULATIONS

SGS supports manufacturers and retailers establish the impact of environmental conditions on the function of consumer electronics through various types of tests:

Environmental Simulations for Temperature / Humidity / Weather:

- Cold/Heat Testing
- Temperature Cycling Testing
- Salt Spray Test
- Thermal Shock Test
- Ozone Testing
- Altitude / Low Pressure Testing
- Temperature / Humidity Cycling Test
- Water / Rain / Dust Proofing Test
- High Temperature Gradient Cycling Testing
- Mixed Flow Gas Corrosion Test
- Steady State Temperature / Humidity Testing
- Solar & UV Irradiation Testing
- PCT (Pressure Cooker Testing)

Environmental Simulations for Mechanical Stress:

- Sine Wave / Random Vibration Testing
- Bump Testing
- Mechanical Shock Test
- Drop Testing
- Bouncing & Loose Cargo / Swinging Testing
- Package & Transportation Testing

CONNECT WITH SGS

We identify the applicable regulations and standards for your specific product and your target markets. SGS supports you reduce risk, improve efficiency and ensure compliance to contractual or regulatory requirements in all your manufacturing, sourcing, distribution and retailing operations.

TECHNICAL ASSISTANCE

Product reliability, as well as safety and costs, should be taken into consideration at every stage of production.

SGS supports companies in achieving this through the following services:

- Reliability Programme Assessment
- Reliability Models and Predictions
- Education for Reliability Engineering
- Failure Modes and Effects Analysis – FMEA
- Reliability Demonstration Test
- Failure Analysis
- HALT – Highly Accelerated Life Test
ESS / HASS Profile development
- RoHS Reliability Transition Program
- and more

STAY UP TO DATE

As you consider your company's compliance challenges, let SGS support you to make the best decisions for your business.

To keep abreast of the developments reshaping your industry sector, subscribe to our free publications at:
www.sgs.com/subscribe.



CONTACT US

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AND CERTIFICATION COMPANY.**

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WHEN YOU NEED TO BE SURE

SGS